An Application to the National Ocean and Atmospheric Administration's Coastal Management Fellowship Program

INCREASING COASTAL COMMUNITY RESILIENCY IN MAINE

Example of Pile Foundation, Saco, ME. Image by P.A. Slovinsky, 12/2009.

Submitted by:
The Maine Coastal Program
Maine Department of Agriculture, Conservation and Forestry

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Background/Introduction

Maine's Vulnerability to Coastal Hazards

Flooding and beach erosion - existing hazards in coastal Maine - are likely to become more chronic and severe in upcoming decades due to changes already underway. Since 2003, sea level rise in the Gulf of Maine has accelerated from 2 mm/year to 7 mm/year.[1] Local data from the Portland tide gauge indicates acceleration in the rate of sea level rise from a historic 1.8 mm/year over the past century, to over 4 mm/year in the past 2 decades.[2] As a result, the incidence of minor and moderate coastal flooding has become significantly more frequent in the last decade.[3,4] Increasing storm intensity, as indicated by a 70% increase in heavy precipitation events since 1958[5], is likely to compound coastal erosion and flooding damage from more intense storms. The 100-year rain event in Portland, Maine increased from just over 6 inches to over 8 inches, almost a 30% increase since the 1950s.[6] Under a high emissions scenario, a 1-in-10 coastal flood could become a 1-in-5 flood by 2030.[7] Increased and combined coastal hazards urgently need to be assessed in order to plan for and adapt to impacts in coming years and decades.

Previous Work. The Maine Coastal Program (MCP), with funding assistance from NOAA's Office for Coastal Management (OCM), matched by state and local resources, worked aggressively over the last decade to educate coastal communities about shoreline change, sea-level rise and storm surge. We have provided downscaled sea-level rise and storm surge maps and forecasts to 36 coastal communities and a web portal for mapping Category 1 and 2 hurricane potential inundation was developed by the Maine Geological Survey. MCP has worked intensively with 12 coastal communities to design and implement adaptation strategies. Several communities have incorporated hazard threats and adaptation responses in their Comprehensive Plans, amended Shoreland Zoning and Floodplain Management ordinances, and included infrastructure adaptation needs in Capital Improvements Plans, but there is much more work remaining to be done.

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[1] Yin and Goddard, 2013, doi:10.1002/2013GL057992.

[2] Slovinsky, P. A., 2014, personal communication.

[3] Ezer and Atkinson, 2014, doi:10.1002/2014EF000252.

[4] Slovinsky, 2012, Watching the Tides, MGS web site.

[5] National Climate Assessment, 2014, globalchange.gov.

[6] Cornell University, 2014, Extreme Precipitation in New York and New England.

[7] Kopp et al., 2014, doi:1002/2014EF000239.

In addition to municipal collaboration, successful partnerships to achieve progress have been built with Maine's Regional Planning Commissions, Maine Coast Heritage Trust (land conservation NGO) and others. MCP has also collaborated with the Wells National Estuarine Research Reserve on climate change training and with Maine Sea Grant Extension on a stormwater planning effort in Ellsworth, Maine and a state-wide guide on coastal hazards for homeowners.

Project Element I. Create a Maine Hazard Resilience Index. MCP's collaborative work has focused on shoreline change, flooding, storm surge and sea-level rise vulnerability and adaptation planning along 3,500 miles of tidally-influenced shoreline. As a result of MCP outreach and funding, two regions of the state (Washington County – Maine's most economically depressed region, and Lincoln County in Midcoast Maine) have initiated work on multi-hazard assessments and outreach. However, a consistent, statewide "Hazard Resiliency Index" does not exist. After exploring existing tools (e.g. the Gulf Coast Coastal Community Resilience Index[8] and Renschler (and others)[9] work in Southern Louisiana, some customization is needed for a Maine-specific Index. Data from NOAA's Digital Coast and information from the National Ocean Economics Program[10] will be useful in creating a Maine Index and OCM training resources (such as the *Roadmap for Adapting to Coastal Hazards* training[11]) will be useful in implementing the Index at the community level. To fully understand all aspects of hazard vulnerability (physical, economic, socio-cultural and ecological), to plan for and achieve resiliency, and to chart progress, Maine's coastal communities need a multi-hazard assessment tool -- a state-specific Hazard Resiliency Index.

Project Element II. Improve Maine Coastal Community Participation in the FEMA Community Rating System. One criterion for establishing a resilient coastal community is a community's participation in the National Flood Insurance Program's (NFIP) Community Rating System (CRS). The CRS is a voluntary incentive program to help participating municipalities (and their insured property owners) save money on federal flood insurance. Communities participating in the CRS adopt actions that go above and beyond the minimum NFIP requirements and qualify towards scaled cost savings. The more activities a community undertakes to promote sound floodplain management, the more points they can earn toward reducing flood insurance premiums for its citizens.[12]

Generally, only those towns with a high number of flood insurance policies will consider participating in the CRS, (i.e. the amount of effort to participate must result in significant savings to warrant participation). Seven of the state's 17 CRS participant towns are in the coastal zone but only

[8] http://masgc.org/coastal-storms-program/resilience-index

[9] http://lesami.geog.buffalo.edu/projects/completed/noaa-community-resilience-index/

[10] http://www.oceaneconomics.org/

[11] http://www.coast.noaa.gov/digitalcoast/training/roadmap

[12] Each 500 points "earned" by a community qualifies their residents for a 5% reduction in the premiums paid by its citizens who purchase flood insurance. FEMA-approved activities that communities can do to reduce the flood risk in their towns include four broad topic areas – Public Information, Mapping and Regulations, Flood Damage Reduction and Flood Preparedness.

four of the 10 communities with the highest number of flood insurance policies participate in CRS.[13] Four coastal towns have lost CRS status[14]. The Town of Wells (with the most number of NFIP policies in the state) was a former CRS participant but is not at present.

Conversations with local officials indicate that there is limited understanding of potential savings and lack of knowledge about programs that the communities are already undertaking that qualify for CRS points. Officials also noted that the volume of information required annually by FEMA to retain CRS membership is onerous given lack of municipal resources. Additionally, new efforts that communities have undertaken through participation in MCP hazard resiliency trainings and use of the *MCP Hazard Resiliency Toolkit*[15] may qualify communities for better CRS classifications. Finally, Maine's floodplain management program lacks the staff and financial resources to work with communities on CRS participation and there is only one CRS Coordinator on the on the FEMA Region I staff to assist with CRS throughout New England. Efforts now underway in other US states are exploring increased use of CRS (e.g. NOAA /Northeast Regional Ocean Council-funded project in Milford, Connecticut and a National Fish and Wildlife Foundation-funded effort by the Association of State Floodplain Managers and the Coastal States Organization focused on communities in Rhode Island and Ohio). Although the characteristics of Maine coastal communities are quite different, elements of these current case studies and some resource materials may assist in Maine's effort to increase use of the CRS,.

Project Element III. Identify Policy Options – Incentives for Resiliency

Aside from savings in flood insurance premiums through participation in CRS and the ability to qualify for federal grants, we are unaware of economic incentives for Maine communities and property owners to undertake resiliency efforts. Incentives such as property tax relief or other state and local incentive programs are needed and should be explored and documented for consideration by state and local decisionmakers.

Goals and Objectives

Goal 1. Strengthen the Resilience of Maine's Coastal Communities and Coastal Regions
Objective 1A. Over two years, five coastal communities will use Maine's Hazard Resiliency Index; understand their vulnerabilities from physical, economic, socio-cultural and ecological perspectives; plan actions to address their challenges and serve as models for other communities.
Objective 1B. Over two years, additional communities will participate in FEMA's CRS program; communities that have lost CRS status will be ready to rejoin the program; and other communities

[13] Five communities (York, Old Orchard Beach, Saco, Portland and Ogunquit) have earned a CRS class of 8, resulting in a community-wide savings of 10% on federal flood insurance. Southwest Harbor and Cape Elizabeth have earned a CRS class rating of 9, resulting in a 5% savings.

[14] Arrowsic, Georgetown, Hallowell and Wells have lost CRS status

[15] The Toolkit, developed with the Southern Maine Planning and Development Council, includes model language for comprehensive plans, and shoreland zoning and floodplain management ordinances.

will be poised to achieve a better classification in the CRS program. All communities will serve as models for increased and more rewarding participation in CRS.[16]

Objective 1C. State and local decision-makers understand potential policy options for incentive programs that (if pursued) may result in higher community and property owner participation in resiliency efforts.

Milestones and Outcomes

- Fall 2015 (initial 4 weeks) – Fellow completes orientation to Maine state government, the project, and partners. Fellow and Mentor continue to identify mutual needs, professional and personal goals, and identify Fellow's affinity for project elements, potential challenges and training needs. Mentor/Fellow revisit the scope of the project and anticipated outcomes and revise as necessary.
- Fall 2015 (within 6 weeks) – Fellow finalizes his/her work plan and begins interaction with project partners. Fellow formalizes a Project Advisory Committee.
- Late fall 2015 – Fellow completes research on existing Hazard Resiliency Indices and completes interviews with practitioners about strengths and weaknesses of existing approaches. Fellow completes interviews with municipal officials including questions about incentives needed to pursue municipal adaptation projects.
- Early Winter 2016 – Fellow drafts Maine Hazard Resiliency Index and beta-tests the tool with Advisory Committee and one or more focus groups.
- Mid-Winter 2017 – Fellow finalizes the Index and conducts train-the-trainer workshop. Index is publicized and schedule for delivery to towns is devised and use of the Index is tracked.
- Spring 2016 – Fellow completes research on the use of CRS in Maine including interviews with participating and non-participating communities. Fellow completes research on CRS improvement projects in other states. Fellow's research includes a focus on incentives needed by Maine towns to improve their hazard resiliency.
- Summer and Fall 2016 – Fellow presents poster on Year 1 accomplishments at national conference or other venue. Fellow reaches conclusions about CRS participation and begins design of approaches to improve participation, working in-depth with towns selected by a Letter of Intent process.
- Winter 2017 – Fellow completes work with selected communities, begins development of tools for communities to use to enhance their CRS rating; to maintain their participation in the program, and to join or rejoin the program.
- Spring 2017 – Fellow formalizes technical assistance materials, conducts train-the-trainer workshop and creates a monitoring method to track progress on CRS use in Maine.
- Summer 2017 – Fellow completes final project report, including development of recommendations for use by FEMA and NOAA. Fellow completes short white paper on incentives that can be adopted by state and local governments to foster community and property owner resilience efforts.
- Summer 2017 – Fellow presents final work at national conference or other venue.
- Throughout term of fellowship – Fellow and mentor meet at agreed upon intervals; mid-course adjustments are identified and completed. Fellow attends all required OCM meetings. Fellow

[16] The anticipated number of communities to achieve these results cannot be estimated due to FEMA's windows for accepting new communities into the program and their window for considering changes to community CRS classifications. Realistic estimates of what the Fellow may accomplish will be developed as the project progresses.

completes needed training and completes professional development activities. Depending on FEMA's schedule, the Fellow may complete CRS training during the fellowship.

Project Description

The following project description contemplates an ambitious workplan for a two-year fellowship. Similar to Maine's past successful fellowships, the Fellow's workplan can be modified according to the strengths and professional development goals of the Fellow, i.e. one or more of the three project components may be stressed over others. The project is designed to offer the following to the fellow:

- Ability to use critical thinking and creative problem-solving skills to improve coastal management;
- Opportunities to innovate in the development and delivery technical assistance materials;
- Experience working at the local level and with a wide variety of staff and partners, including a project Advisory Committee;
- Exposure to state/federal policies, programs and regulations;
- Experience in product/project evaluation; and,
- Development of marketable skills and preparedness for a career in hazard mitigation, community planning or coastal management.

This project requires a Fellow with a high degree of competence in community planning, science translation, public speaking, writing, and web page content development, and basic knowledge of hazard resiliency concepts. Course work in geology or shoreline processes, public policy, environmental law, and government will be beneficial. Other skills needed include excellent communication skills (applied with diverse audiences), the ability to work with a team, facilitation skills, problem-solving and critical thinking skills, good interpersonal skills, patience and a sense of humor. The Fellow must have a clean driving record and be able to obtain a Maine driver's license to operate state vehicles.

<u>Project Element I. Hazard Resiliency Index</u>

- Research existing resiliency indices and determine their utility for Maine coastal communities.
- Use results of research above, develop a "Maine Coastal Community Hazard Resiliency Index".
- Beta-test the index with coastal communities and Advisory Committee.
- Create web-based tutorial and assessment rating sheets.
- Select a coastal region (Letter of Intent to participate) that will receive hands-on technical assistance to use and complete the Index.
- Publicize the index via regional forums, webinars and conferences (e.g., the Maine Municipal Association annual conference, the Maine Association of Planners annual meeting and the annual Grow Smart Summit, etc.).
- Track the number of participating communities; summarize results.
- Conduct analysis of the index and document recommendations about its value and utility as a continuing program.

Project Element II. Community Rating System

- Design and administer a preliminary survey of coastal towns about their awareness of the CRS and its benefits, their interest in either participating, rejoining, or improving their CRS class.
- Work with communities to complete FEMA's CRS self-assessment to understand potential cost savings for towns uncertain about benefit to level of effort ratio.
- Select a sample of towns to work with via a Letter of Intent, (e.g. a non-participating town; a town that was formerly in CRS; one or more towns interested earning more CRS points).
- Understand road blocks to participation or improvement in points. Identify municipal programs/efforts that help qualify for a lower classification. If Maine has programs that might meet CRS objectives but are currently not "approved" by FEMA, initiate work with the agency.
- Create mechanisms to streamline the CRS participation process (i.e. user-friendly improvements to FEMA CRS manual; on-line tools for record-keeping, streamlined processes for annual reporting to FEMA, etc.).
- Provide hands-on technical assistance to participating towns to achieve the measurable objectives stated earlier in this proposal.
- Create and publicize success stories during life of project.
- Disseminate findings to FEMA, NOAA, and other federal agencies.

Project Element III. Develop "Resiliency Incentives" Policy Recommendations for Consideration by Coastal Municipalities

- Research state and local incentive programs that exist or are being contemplated in other regions of the U.S and abroad, and review academic research papers on resiliency incentives.
- Explore resiliency incentives concepts -- e.g. property tax reduction, transfer of development rights and other zoning/land-use incentives, tax incremental financing, etc.
- Assemble and work with a group of local and state officials to "field test" resiliency incentives that are feasible for Maine under current and new regulatory and taxation frameworks.
- Document ideas and results of the group discussion into a white paper summary.
- Present findings to state and local officials.

Fellow Mentoring

Elizabeth Hertz, Director of DACF's Municipal Planning and Assistance Program will serve as the fellow's mentor. Liz is widely recognized as a leader and innovator in Maine's coastal resiliency efforts. She has worked with a wide range of coastal municipalities and regional councils on resiliency education, development of data projects, delivery of technical assistance and design and implementation of community adaptation approaches. Liz has many years of experience as a supervisor and mentor and she employs a "supportive coach" style in her interactions with staff. Liz currently oversees MCP's Project of Special Merit on Marsh Migration, and works with five towns on adaptation strategies. She is a team member on many of the state's resiliency efforts. The fellow will also be assisted by an Advisory Team – core members of the team will include Sue Baker, Director, Maine Floodplain Management Program; Pete Slovinsky, Marine Geologist, Maine

Geological Survey (2001-2003 NOAA Fellow); Stephen Dickson, Marine Geologist, Maine Geological Survey and Kathleen Leyden, Director, Maine Coastal Program. Other potential Advisory Committee members are noted in the following section of this proposal.

Project Partners[17]

- NOAA Office for Coastal Management – Funding, Fellow support, project and grant oversight, ongoing guidance as needed. Collaboration on NOAA/FEMA interactions, federal interagency resilience efforts and NOAA resiliency indices.
- Maine Department of Agriculture, Conservation and Forestry (including Maine Coastal Program, Municipal Planning and Assistance Team, Maine Floodplain Management Program and Maine Geological Survey) –Serve on the Fellow's Advisory Committee and provide assistance with all project elements. Floodplain Management Program staff will provide expertise on FEMA-related issues and the CRS project element.
- Maine Emergency Management Agency – potential Advisory Group member.
- Maine Department of Transportation primary contact for infrastructure resiliency; potential Advisory Group member.
- Maine Center for Disease Control – Regional Community Health Program – potential Advisory Committee member.
- County Emergency Management Agencies and Coastal Regional Planning Commissions – potential Advisory Committee members, potential delivery of technical assistance (Index and CRS Technical Assistance) to coastal municipalities.
- Coastal Municipalities – will be participants in all three project elements, including in-depth work on Project Elements I and II. Participating communities to be chosen via competitive selection (Letter of Intent).
- Association of State Floodplain Managers and Coastal States Organization – will serve as resources for Project Element II.
- University of Maine and NOAA Fisheries, Northeast Fisheries Science Center– potential advisory committee members for Project Element I (socio-economics aspects of resiliency).
- University of Southern Maine – potential assistance on CRS survey design.
- Island Institute, Maine Sea Grant Extension Program, Wells National Estuarine Research Reserve – potential Advisory Group members and potential partners for outreach events (WNERR Coastal Training Program) and delivery of technical assistance (Project Elements I and II) to coastal municipalities and year-round island communities.
- FEMA Region 1 New England CRS Coordinator – primary contact on regional and national CRS issues.

[17] See previous sections of this proposal for summaries of existing state and local efforts and discussion of integration of the fellowship project with these efforts.

Cost Share Description
The Maine Department of Agriculture, Conservation, and Forestry (ACF)/Maine Geological Survey has pledged $15,000 ($7,500 per year) in non-federal matching funds to support the fellowship, payable in two equal payments. The MCP will provide office space, equipment, and supplies needed and will enhance the Fellow's training, skill development and professional development through sponsorship at conferences, events and training (beyond those covered by NOAA).

Relationship to NOAA's Strategic Focus Area
This fellowship proposal directly supports NOAA's "Resilient Coastal Communities" Focus Area in the following ways:

- The Hazard Resiliency Index (Project Element I) will create a simple analytical tool to help communities assess vulnerabilities, track successes and determine their future areas of focus toward community hazard resiliency. The Index will enhance community understanding of multiple aspects of climate adaptation preparedness in the areas of natural resources, the built environment and public health.
- Project Element II (CRS) will engage community participation by focusing on incentives (cost savings) that will benefit communities and residents.
- Project Element III (Policy Options) will identify concepts for state and local governments to explore meaningful incentives that may benefit property owners who practice sound community adaptation practices.
- Project Element I will offer valuable input to FEMA to assist in their reform of the CRS and enable its use by predominantly rural coastal communities lacking technical capacity.
- Project Elements I and II will assist NOAA OCM in future development of tools for coastal communities (particularly rural towns lacking professional planning capacity).
- All three project elements will build state and local capacity.
- All three project elements will use credible data, quality technical assistance and innovative policy tools.
- All three project elements will include a diverse group of participants and partners, some of whom will be equipped to deliver tools and technical assistance to communities.
- All three project elements will assist NOAA OCM in their ongoing efforts to forge improvements in federal inter-agency hazard resiliency programs.

In addition, the project will emulate core NOAA OCM practices:

- Using credible science-based information;
- Avoiding duplication and fostering innovation by building upon existing efforts;
- Using use the latest and best methods of communicating with diverse audiences;
- Creating case studies and replicable tools for use by others; and,
- Employing rigorous methods to evaluate the project's progress, and its final products.